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Title: REPORT ON BUNA MANUFACTURE AT SCHKOPAU

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REPORT ON BUNA MANUFACTURE AT SCHKOPAU

Present-day production does not deviate appreciably from the customary methods. However, the plant engineers are setting up test production in shop C 39 of a new product derived from Perbunan and superior to all products being made at present.

For an attempt to determine the production of the plant:

One emulsion is made every 3½ hours, each corresponding to 40 x 8000 liters of product. Between 14 July and 19 August, 245 emulsions were made.

List of byproducts:

Soap powder

Carbide (?)

Aldol (22 cubic meters per day)

Phthalic acid (10 to 15 cubic meters per day)

Butole (?) (146 tons per day)

Ethyl alcohol

Butanol (21 tons per day).

B u n a P r o d u c t i o n

The normal process (calcium carbide - acetylene - acetaldehyde - treated with NaOH to make aldol - with hydrogen under pressure to butylene glycol - butadien emulsion and polymerization to make latex - precipitation with sodium to make crude Buna) has undergone no major changes. However, under Russian pressure, a lot of experiments are being performed. One field of the experiments is concerned with the special additives, catalysts, and activators, the other with a sharp reduction in the precipitation time.

Reportedly, shop C 39 has built a new butadiene installation for experimental purposes. Chief engineer Kirpichnikov ordered personally that no experiments were to be performed but that the installation was to start regular production right away. It took a great deal of remonstrating before the production quota set for this installation for the month of September was canceled and applied to October instead. The industrial rubber produced there is said to be something quite novel, and the "activists" of C 39 were told that not even the Americans are producing it. It was found out that this shop is to produce a further development of Perbunan (an old favorite of the Soviet laboratory staff at Schkopau) by the use of acrylonitrile, and diproxide, and other additives. It has a much higher tensile strength

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than Buna 88 and ~~xxxxxx~~ can be used over a very wide range of temperature.

The source of Buna (latex milk) is in C 60; the emulsion is made in B 59.

The emulsion in C 59 is put into 5 vats. The ratio for Buna S 3 is 17,700 liters of emulsion plus 30,000 liters of hydrocarbon, at a temperature of 35° C. The emulsion is made by dissolving 16 kg of diperoxide in 320 liters of styrene. This is sufficient for 17,700 liters of emulsion, or 20 tons by weight. Of this, 60% is precipitated as crude rubber, the other 40% are classified as "recovery products", consisting of buna gases, styrene, and butadiene, removed by vacuum and electric pumps.

In C 60, the preliminary mixers removed this mixture to four batteries of ten 8,000-liter vats each. The installation dismantled in 1947 had been a very modern one; each battery had 12 vats of 12,000 liters each. It was dismantled together with B 60, where styrene for F 59 was produced. The installation worked 5 to 6 hours per batch; this time could be cut to 4 hours, except at the most modern installation F 59, where each batch took only 2 hours, 40 minutes allowing more than 10 batches per 24 hours ~~turn-around-through~~ and yielding very high production. Until May, C 60 was operated on a 3 3/4 hour schedule around the clock. Since July the time has been cut to 3½ hours, by Soviet order, which means that the mixture is removed every three hours from each tenth vat. An injection system is now used in the various phases in which the mixture is run through the vats. The diperoxide mixture is injected into the third, fifth, and seventh vats (thus the precipitates, in that order, are 20, 30, and 45 per cent). An activator is added in the preliminary mixer. This activator is no longer the zinc oxide which was used during the war, but persulfate, which reportedly accelerates the precipitation of rubber even more.

Our source states that the exact production of Buna can be calculated from the above data in connection with the following figures: Since 14 July 1949, operations have been on a 3½ hour schedule. Each batch is given an "emulsion number", starting with 16 at midnight of Jan 1 1948. The number and time are chalked on little shields on the batteries. The following numbers have been observed at C 60:

3681: 14 July

3721: 20 July (17,700 liters in 3½ hours)

3733: 22 July at 0830 hrs.(record on the preliminary mixer)

3740: 23 July at 0630 hrs.

3741: 23 July between 1000 and 1330 hrs.

3755: 25 July

Between 15 July and 26 July, SS was run through; now S 3 is used again, which requires 7800 liters of hydrocarbon per emulsion batch.

3756: 25 July, 1430 hrs. (intermediate product of SS and S 3)

3762: 26 July, 1130 hrs. (pure S 3, intermediate run finished)

SS contains 55% styrene, and 45% butadiene (or Buman - reportedly the same thing, but the shop foreman doubts that). S 3 is made of a mixture of 70% styrene and 30% Buman; the finished product is a 60% yield from 20 tons. Thus, on the average, 6% is polymerized in each vat. Another shop foreman called the diproxide injections in vats 3,5, and 7 emulsifiers. The Russians ordered that these injections alternate with injections of phthalic acid, reportedly also an emulsifier. To repeat: D 59 supplies the finished emulsion, while at C 60 the emulsion is only mixed with hydrocarbon.

3777: 28 July, 1530 hrs.

3783: 29 July, 1230 hrs.

3804: 1 August, 1100 hrs. The time is cut experimentally to 3 hrs and 20 min.

3805: 1 Aug., 1420 hrs.

3811: 2 Aug., 1020 hrs.

3833: 5 Aug., 1200 hrs. Experimental injections of 6.9 liters of diproxide into each vat every hour.

3839: 6 Aug., 0800 hrs.

3853: 8 Aug., 0640 hrs. New mixture now used: 30,400 liters of hydrocarbon, 17,000 liters of emulsion. S 3.

3854: 8 Aug., 1000 hrs.

3863: 9 Aug., 1600 hrs. (D 59. The emulsion contains, among other things, sodium hydroxide, t/phol(?), and beta-phenyl. The latter is reportedly an excellent precipitation accelerator.) phenyl beta naphthalamine.

3877: 11 Aug, 1040 hrs. (time still only 3hrs.20 min.)

3883: 12 Aug. 1040 hours

3911: 16 Aug., 1240 hrs.(still 18 kg diproxide per 320 kg styrene)

3924: 18 Aug. 1010 hours (during the previous night Igetex was run as an intermediate product. Time is again 3½ hours)

3926: 19 Aug., 1710 hrs.

A 50 houses 8 compressors of 600 w, 150 kw, 14.5 amps current consumption, 1000 rpm manufactured by AEG. They are numbered from 1 to 8. Pumps 1 - 3 are for propylene, 4- 8 for butadiene.

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Compressor 3 can be connected to pump either one of the two substances. Record of 26 July states: Compressor 1 in reserve, had 7185 hours of operation before shut off. Compressor 2 in operation, has had 6120 hours of operation. Compressor 3 in reserve, 8080 hours of operation. Compressor 4 in reserve, 15270 hours of operation. Compressor 5 in operation, 19060 hours of operation. Compressor 6, major overhaul, 15276 hours of operation. Compressor 7 in operation, 1959 hours of operation. Compressor 8, pump undergoing repair, 6700 hours of operation. The production table carries the note: K 1 - 3 compressor oil, K 4- 8 [illegible] butol.

According to our source, the production figures can be computed from these data.

E 45, hydrocyanic acid installation, makes soap powder. The wrapping is printed in Russian only. Works two 12-hour shifts. Production 960 kg per shift. Soap is used as base for shampoos and cleansers (very strong).

Carbide production: One furnace supplies about 60 tons of carbide per day. The new furnace, No. 8, has more than three times the capacity of each of the other seven.

D 29: Aldol installation: Operates two 12-hour shifts. Each shift produces 11.3 cubic meters of aldol, including 3 cubic meters of alcohol.

D 32 and D 36 produce a quantity of phthalic acid, varying between 10 and 15 tons per day. It is in powdered form, made of naphthalene and sulfuric acid. The Buna Works receive 30 to 40 boxcars of napthalene, in powdered form from Czechoslovakia and in large pieces and blocks from the Soviet Union.

The sodium hydroxide produced in C 56 is shipped to the Schwarza cellulose wool plant and to Flauon. It is shipped in tank cars.

In D 47, 6 rolling trains are in operation. Each puts out one roll of buna, weighing 100 kilograms, every 8 minutes. Buna S 3 is shipped to Ketschendorf, Reifen-Mueller Leipzig, Riesa, and a large number of other firms.

D 29: Crude butol (?)- monthly production quota 4630 tons, actual production 146 tons per day. Alcohol: Production quota 195 tons per month, actual 6.3 tons per day. Butanol: 650 tons per month quota, actual production 21 tons per day.

D 29, according to the bulletin board of the morning shift, produced 11.2 cubic meters of aldol, on 10 August, including 3.3 cubic meters of alcohol.

On 22 July, a large, 35-ton tank car of paraffine sludge from the Schwarzheide (near Ruhland) synthetic (gasoline) plant was received. It was emptied at the D 59 emulsion installation, reportedly for the production of Buna SS. On the same day, C 34 received two full tank cars containing 165 hectoliters of formaldehyde each.

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On 29 July, a tank car with 18 tons of magnesium chloride from Kruegershall was received. Stock number 416316.

On 2 August, 1 car with 15 tons of magnesium chloride from Kruegershall was received Stock number 416316.

On 3 August, from same source, 4 cars of magnesium chloride were received, two of 16 tons each, and two of 17 tons each.

On Aug. 8 two bright-red Hungarian boxcars arrived from the firm of "Klotild", Budapest. Two tanks cars of 150 hectoliters each observed in front of the acetone installation.

On 12.August another Hungarian freightcar for "Klotild" of Budapest was loaded with acetone and sent off the same day.

On 19 Aug 1 tank car with 11 tons of ~~beta-phenyl~~ arrived from Wolfen, and two tank cars with 18 tons each of magnesium chloride solution arrived from Kruegershall (stock number ~~changed to~~ 434116).

Legend for table: (dates to be reversed, e.g. read 7. 18 instead of 18.7).

Date	Carbide (?)	Buna	Igelit	Sodium hydroxide

This table shows

a) that the overall plan has been met

2) that production varies greatly from one day to the next. This is due to the relative shortage of raw materials which prevents regular production.

It has already been stated that Schkopau received two tank cars from Ludwigshafen and one from Witten (via Czechoslovakia) per week.

The tank car from Witten arrives ~~very promptly~~ regularly and contains synthetic fatty acids.

Ludwigshafen has been sending ~~sent~~ phenyl beta naphthylamine (?) , an accelerator to Schkopau. On orders from the Soviet Military Administration, Schkopau has started producing it itself. The production started in May, but the quantities produced are still insufficient, and the plant had to import one carload of this product during August.

Personnel list: (The letters and figures following the names indicate the location of the shops and refer to the enclosed map [map is not included]).

Key Personnel as of end of July 1949:

Soviet General Directorate:

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General Director : Nasarov, Bldg. B 13, Room 3

Chief Engineer: V.A. Markeyvich

Master Engineer: Ka N. Golovin

Deputy Chief Engineer: P.A. Kirpichnikov

Planning Engineer: A. M. Buterin

Sales Director: M. Ts. Maldikov

Engineer in charge of purchasing: L.V. Monakhov

Interpreter: Saulit

Engineering chief of Technical Bureau Buna II: Gurilev

Deputy chief: B. Kutsenok

Economic director: S. M. M Markayan

Chief of Technical Bureau Plastmassa, Chemical Group, Chief Engineer Gordonov

German Administration:

German Plant Director: Dr. Nelles

Chief of Production Department: Dr. Moll

Chief of Technical Department: Chief Engineer Schumacher

Sales Director: Roehr

Chief of Planning Department: Dr. Albrecht.

Production Department A:

Department Chief: Dr. Kehlen

Aldehyde plant: at present vacant

Aluminum chloride plant: Dr. Henn

Acetone plant: Dr. Eckardt

Acetylene plant: Dr. Adan

Chlorine plant: Dr. Spoun

Electrode plant: post vacant

Acetic acid plant: Dr. Eckardt

Sintered calcium plant: Dr. Knickenberg

Carbide plant: Dr. Striebel

Catalyst plant: Dr. Hauke

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Production Department K:

Department Chief: Dr. Sodemann

Aldol Plant: Dr. Elbs

Aldol hydrogenation plant: Dr. Dehnert

Ethyl benzene plant: Dr. Morgenstern

Butadiene plant: Dr. Schumann

Butanediol, and butenediol plant and tetrahydrofurane plant: Dr. Dehnert

Butole distillation: Dr. Dietl

Hydrogenation ethylene plant: Dr. Hanschke

Catalyst plant: Dr. Schaefer

Styrene plant: Dr. Morgenstern

Production Department P

Department Chief: Dr. Fischer

Buna-S Finishing Plant: Dr. Behringer

Buna-S polymerization plant: Dr. Bohne

Buna-Z production: Dr. Zauker

PCU Plant: Dr. Ostermeyer

SS-oil plant: Dr. Rosinsky

Production Department Z:

Department Chief: Dr. Werner Mueller

Ethyl oxylene plant: Dr. May

Ethyl chloride plant: Dr. May

Emulsifier 1000 plant: Dr. Buschmann

Formaldehyde plant: Dr. Klapproth

Glycol plant: Dr. May

"Palatinol" plant: Dr. Koch

Phthalic acid plant: Dr. Klaproth

Ethylene (?) plant: Dr. May

Vinyl chloride plant: Dr. Boehme

Main Laboratory in F 17: [Copy list of names.]

Dr. Nelles was chief of the main laboratory during the war until 1945.

Dr. Ranft, the deputy chief of the Practical Engineering Department, and Dr. Luttropp also held their posts already during the war.

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